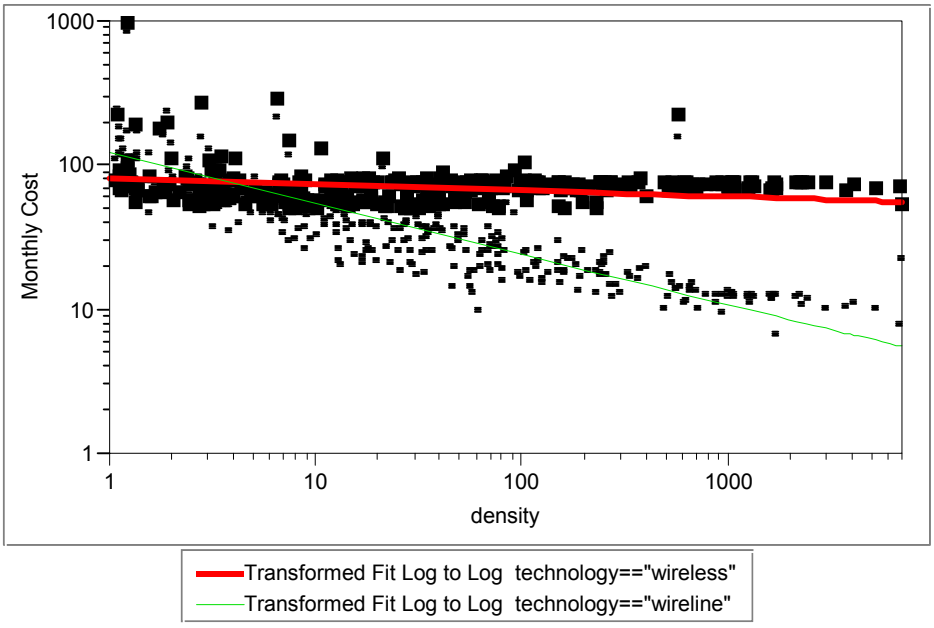
NTCA
NATIONAL TELECOMMUNICATIONS COOPERATIVE ASSOCIATION
The Voice of Rural Telecommunications
www.ntca.org

APPENDIX I

The Hatfield wireless cost model that was submitted by Western Wireless provides some indication of whether wireless high cost areas are the same as those for rural ILECs – early indications are that they are not the same. The model computes wireline and wireless costs by wire center. I ran the model for Washington State and plotted the monthly costs for wireline and wireless service by the population density of the wire center (actually households per square mile). The graph below shows the results, with a straight line fit through the logarithms of costs and densities (the relationship was clearly curved, so the logarithmic transformation was much better than just fitting a straight line through the data).

Monthly Wireline and Wireless Costs by Population Density: WA wire centers



Note: the larger points and thicker line represent the wireless costs; the smaller points and narrower line represent the wireline costs.

Several things are evident from the graph and associated statistics. First, wireless technology exhibits drastically different cost characteristics than wireline technology. Second, density has a more significant impact (negative) on wireline costs than on wireless costs. Third, the "high cost" wireless "wire centers" are just as likely to be in more densely populated areas as in sparsely populated ones (except for exceptionally low densities: $<1/mi^2$). Other states show similar results (qualitatively).

This conclusion is reinforced by the authors of this wireless cost model:

> "In areas with a high density of subscribers the wireline loop costs drop significantly; in low density areas they rise precipitously. Wireless systems are much less distance sensitive. For the most remote wireless subscribers a slightly taller and more expensive tower may need to be erected or a specialized antennae mounted on the subscribers premises, which are both relatively small items in the overall investment required."
>
> "Although not reflected in the model as it assumes total service, in a real world implementation an additional wireless [advantage] is the very scalable distribution network that allows capacity to be expanded as needed with rising subscribership. This is in contrast to a traditional wireline network that must have almost all of its distribution (loop) capacity built before service commences."[1]

[1] "Local Access Over Analog Cellular Networks: Implications for Universal Service Funding and Commercial Mobile Radio Service Carriers," Alan Boyer, HAI Consulting, Inc., 1999, paper presented at the Twenty Seventh Annual Telecommunications Policy Research Conference, Alexandria, VA, at page 23 (the second quote is footnote 42).